WATER SAMPLER ROSETTE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to water sample collecting devices.

2. Description of the Prior Art

Water sampler rosettes are shown in U.S. Pat. Nos. 3,339,417 and 3,489,012. Such rosettes comprise a holder and a plurality of water-collecting containers disposed therearound in a circular arrangement. Additionally, U.S. Pat. No. 4,593,570 discloses a single-water sampling device which, although not adapted for a rosette, is of interest in that it shows the use of ball valves and keys for rotating the same.

Applicant, through his wholly owned corporation, has sold rosettes similar to that shown in U.S. Pat. No. 3,489,012, but being modified to include water-collecting containers having ball valves similar to those in U.S. Pat. No. 4,593,570.

SUMMARY OF THE INVENTION

The present invention is directed to a water-sampler device or rosette comprising a holder and a plurality of water-collecting containers mounted around such holder in a circular arrangement. Each of the water-collecting containers or bottles comprise a tubular member with a pair of opposed, opened end portions with a rotatable valve mounted in each opened end portion.

The first aspect of the present invention comprises a novel triggering mechanism for rotating the pair of rotatable valves from an initially closed condition to a subsequent opened condition and then back to an closed condition to collect a sample of water at a predetermined depth. The triggering means includes an elongated member having a rotation-stopping portion, a central portion, and a spiral rod portion. The rotation-stopping portion includes first and second catch means taking the form of a pair of ledges. With respect to a first longitudinal axis of the rotation-stopping portion, the second catch means is disposed a greater distance from the end of the elongated member and a greater distance from the first longitudinal axis than the first catch member. A rotatable member having a rotational axis is disposed in surrounding relationship to at least a part of the spiral rod portion with the rotational axis of the rotatable member being substantially coincident with a second longitudinal axis of the spiral rod portion. The rotatable member has traversing means which engage opposed sides of the spiral rod portion to cause displacement of the spiral rod portion along the rotational axis of the rotatable member when the rotatable member is rotated. Torque means are provided to apply a torque to the rotatable member. Stop means are mounted to the holder for engaging the first catch means in a first stop position to prevent longitudinal movement of the elongated member along its longitudinal axes and for engaging the second catch means in a second stop position to again prevent further longitudinal movement of the elongated member. Lateral movement means are provided and preferably comprise a solenoid with a plunger to move the rotation-stopping portion laterally with respect to its longitudinal axis and biasing means to limit such lateral movement to a predetermined distance just sufficient to cause the first catch means to clear the stop means and, subsequent to that, to cause the second catch means to clear the stop means.

Once the first catch means is disengaged from the stop means, the rotatable member is no longer prevented from rotating. The rotation of the rotatable member advances the elongated member forward until the second catch means engages the stop means and once again further longitudinal movement of the elongated member is prevented. Coupling means are provided to transfer the rotational movement of the rotatable member to the rotatable valve, so that rotation of the rotatable member permitted by the longitudinal movement of the elongated member between the first stop position and the second stop position allows for the rotatable member to rotate the rotatable valve from its closed position to its opened position. In the same manner, when the lateral movement means causes the second catch means to clear the stop means, the rotatable valve rotates from its opened position to its closed position. Preferably, but not necessarily, joint means are provided in the center protion of the elongated member so as to allow the upward movement of the end of the rotation-stopping portion without affecting the orientation of the second longitudinal axis of the spiral rod portion.

In a second aspect of the invention, each water-collecting container has a cross-sectional configuration of a trapizoid. This unique configuration, which differs from the cylindrical configurations of the prior art, allows for a substantial number of additional water-collecting containers to be mounted around the holder. Additionally, this shape allows the monofilament securing the top casing to go into its grooves better and allows for a better O-ring engagements.

In a third aspect of the invention, a plastic bag is mounted inside of the water-collecting containers.

In a fourth aspect of the invention, a novel drain valve is provided.

BRIEF DESCRIPTION OF THE DRAWINGS

Further objects and advantages of the present invention will become apparent as the following description proceeds, taken in conjunction with the accompanying drawings in which:

FIG. **1** shows a perspective view of the water sampling device of the present invention.

FIG. **2** shows a side view of the water sampler device of the present invention.

FIG. **3** shows a top view of the bottles of the present invention with the cylindrical valve closed.

FIG. **4** shows a top view of the bottles of the present invention with the cylindrical valve opened.

FIG. **5** shows a side view of one of the bottles of the present invention.

FIG. **6** shows a partially cut away view of one of the bottles of the present invention.

FIG. **7** shows a perspective view of one of the bottles of the present invention.

FIG. **8** shows an exploded view of the triggering mechanism of the present invention.

FIG. **9** is a cross sectional view showing the triggering mechanism in its loaded position wherein the cylindrical valve is closed.

FIG. **10** is a cross sectional view showing the trigger mechanism in its second stop position when the cylindrical valve is in its opened position.

FIG. **11** is a cross sectional view which shows the trigger mechanism in its third stop position when the cylindrical valve is again closed to contain the water sample.